FIG. 1
PRIOR ART

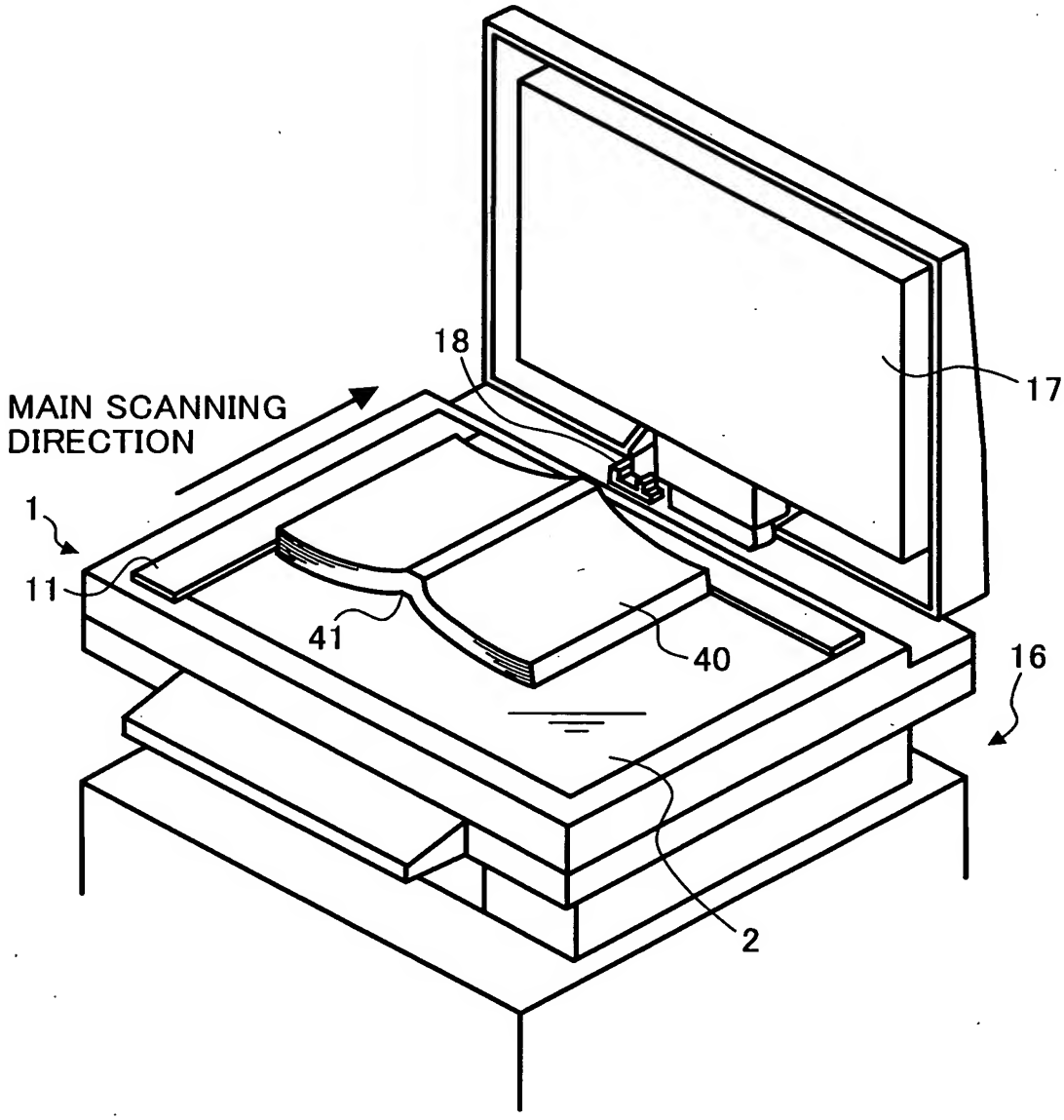


FIG. 2
PRIOR ART

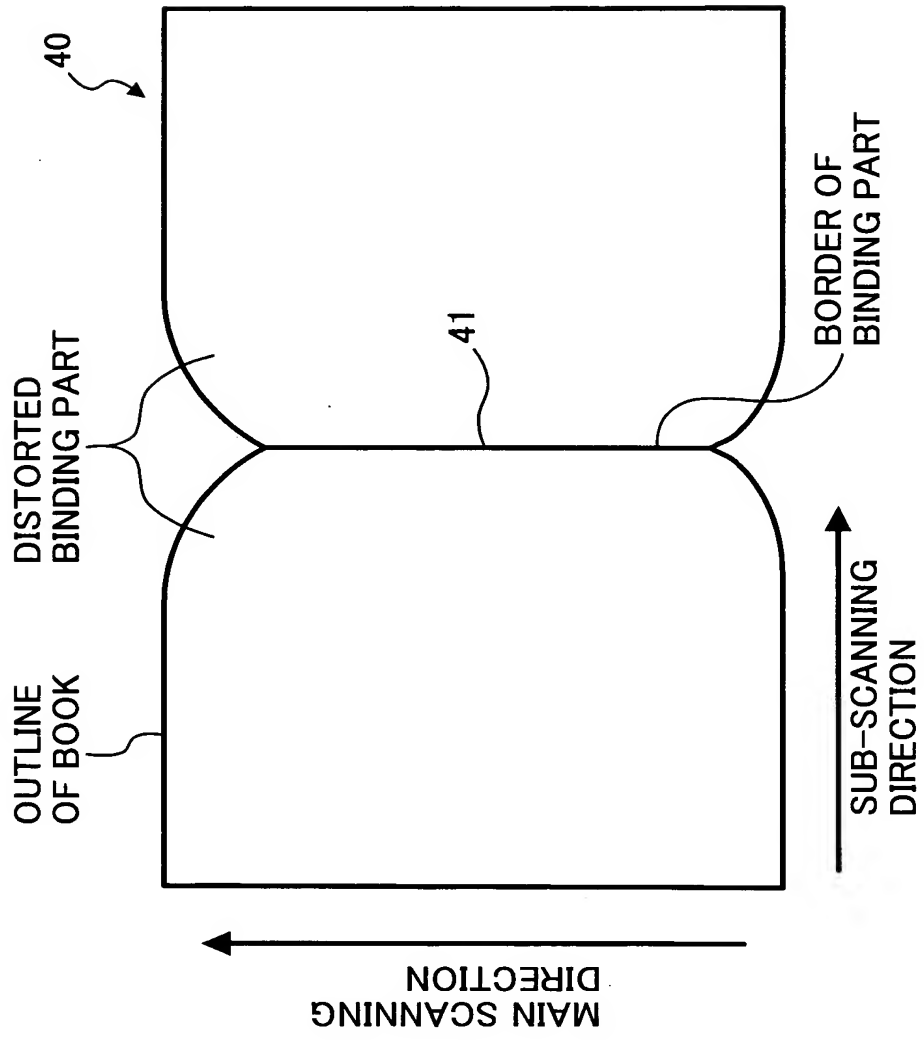


FIG. 3B

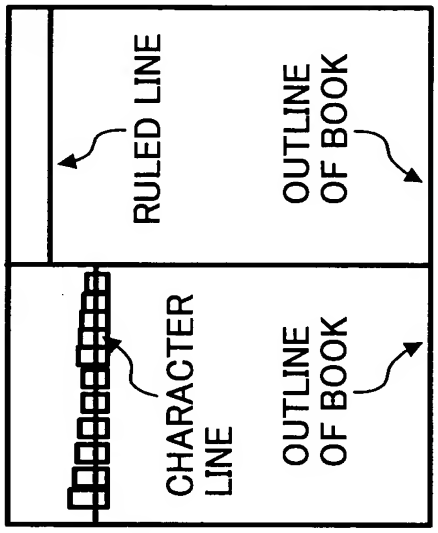

RULED LINE
OUTLINE OF BOOK
CHARACTER LINE
OUTLINE OF BOOK

FIG. 3A

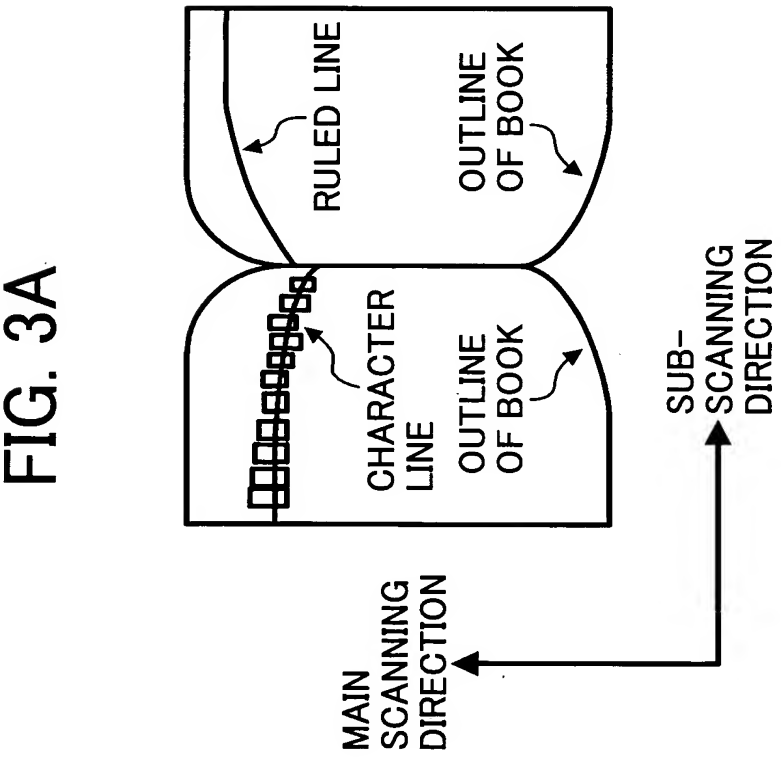

RULED LINE
OUTLINE OF BOOK
CHARACTER LINE
OUTLINE OF BOOK
SUB-SCANNING DIRECTION
MAIN SCANNING DIRECTION

FIG. 4B

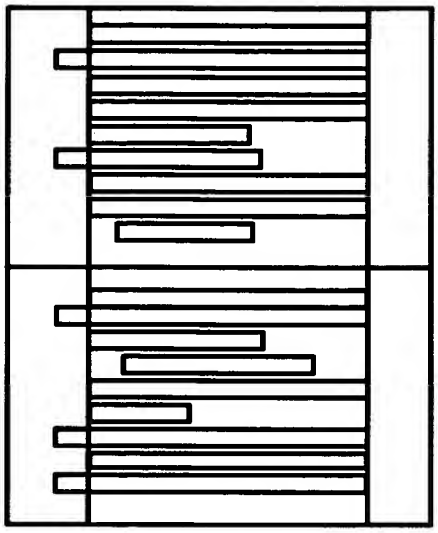
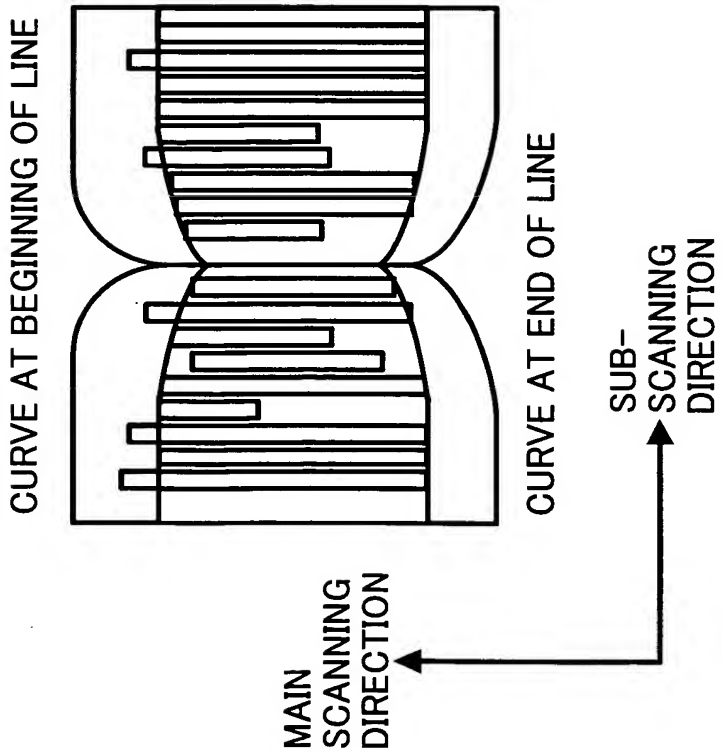


FIG. 4A


CURVE AT BEGINNING OF LINE
CURVE AT END OF LINE
SUB-SCANNING DIRECTION
MAIN SCANNING DIRECTION

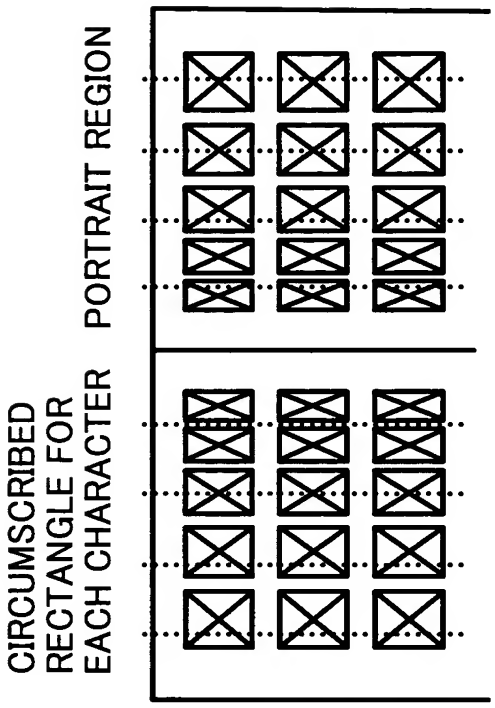

CIRCUMSCRIBED RECTANGLE FOR EACH CHARACTER
PORTRAIT REGION

FIG. 5A

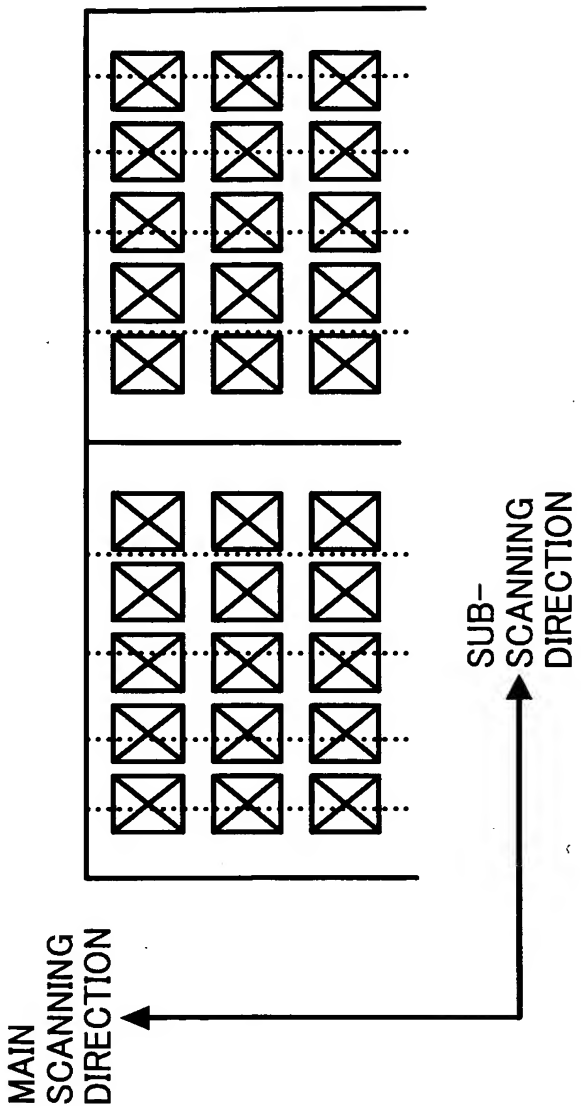

MAIN SCANNING DIRECTION
SUB-SCANNING DIRECTION

FIG. 5B

FIG. 6B

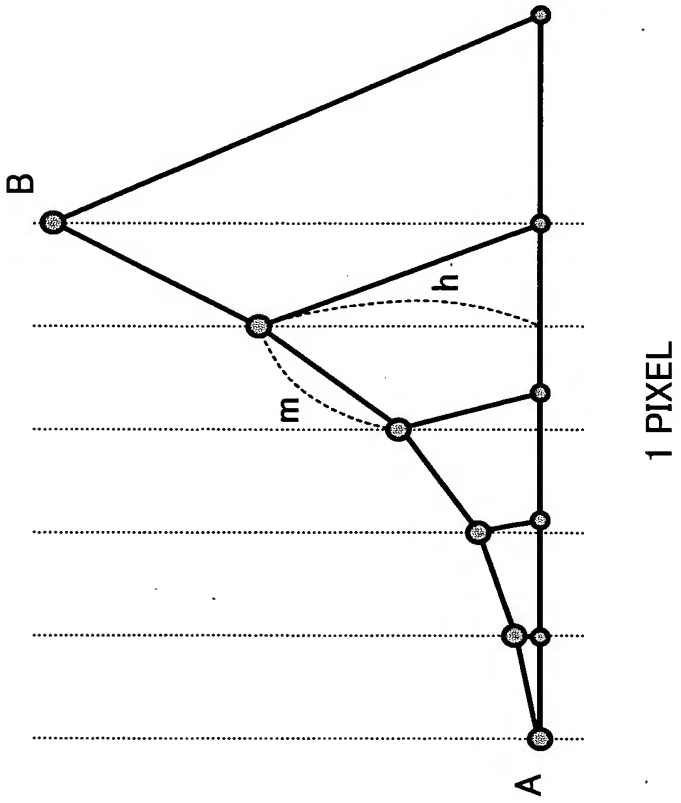

B
h
m
A
1 PIXEL

FIG. 6A

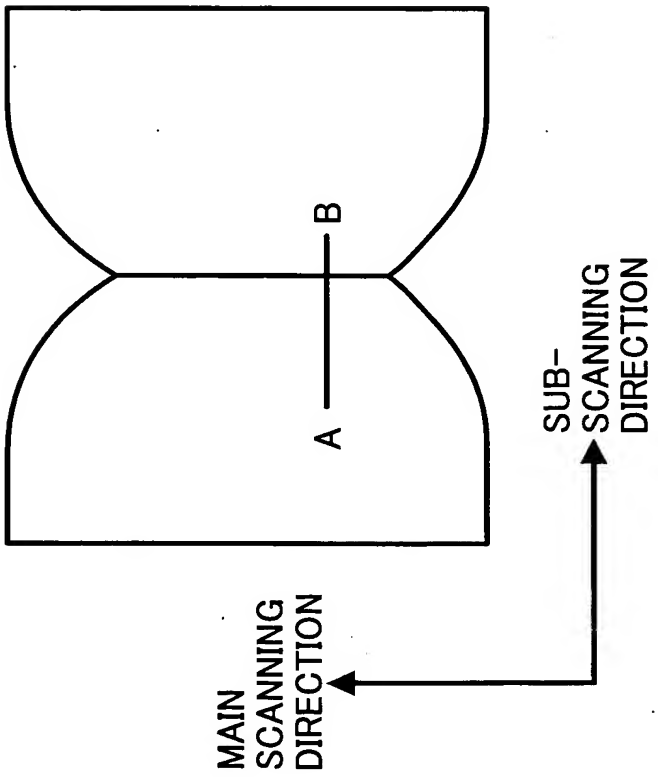

B
A
SUB-
SCANNING
DIRECTION
MAIN
SCANNING
DIRECTION

FIG. 7A

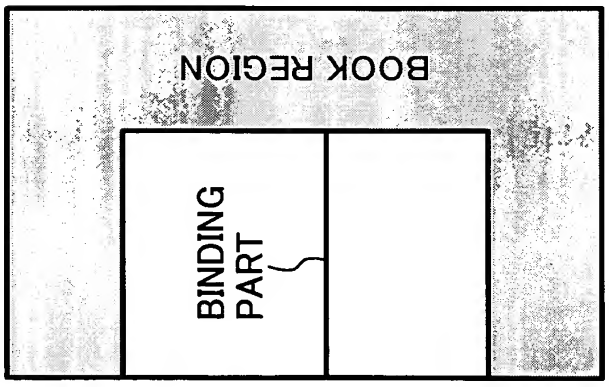


FIG. 7B

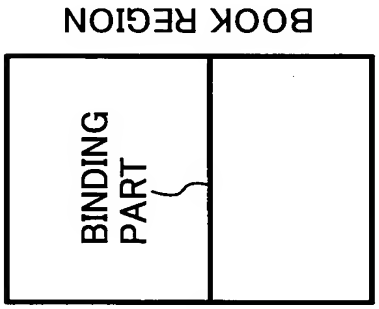


FIG. 7C

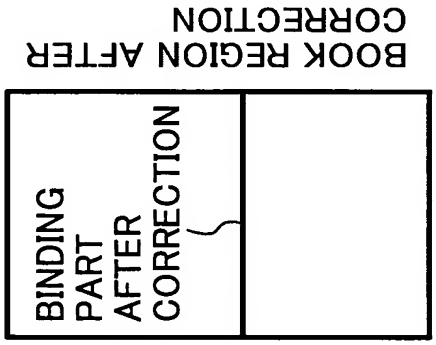


FIG. 7D

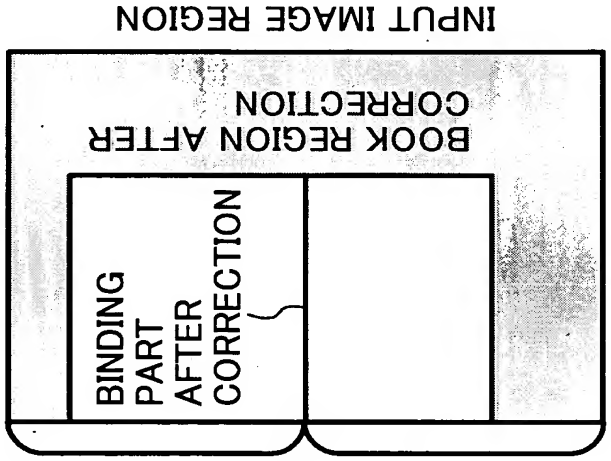


FIG. 8A

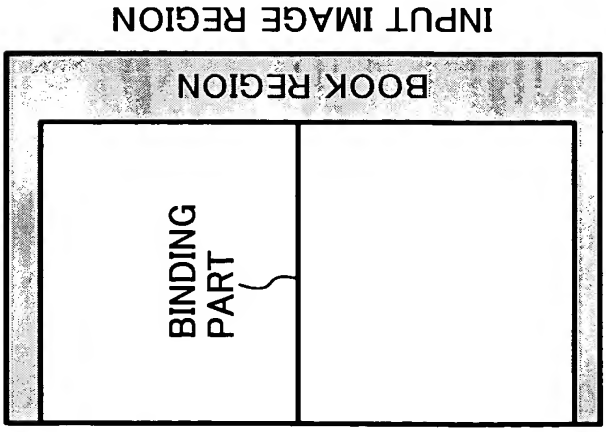


FIG. 8B

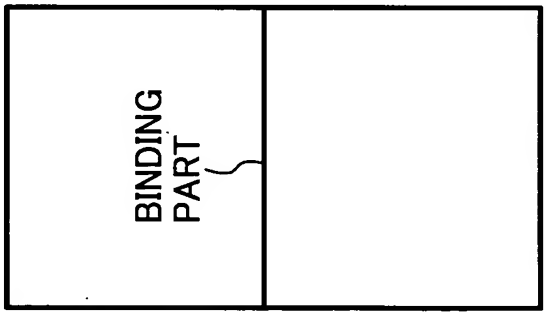


FIG. 8C

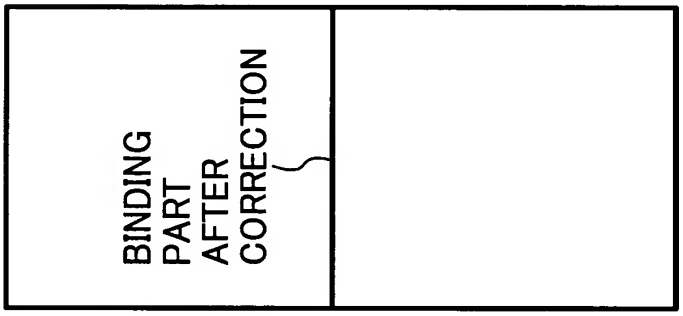


FIG. 8D

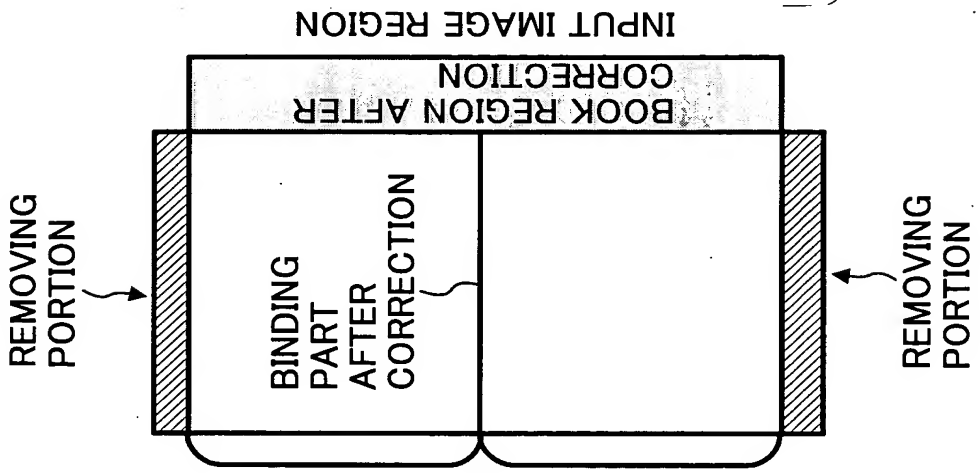


FIG. 9

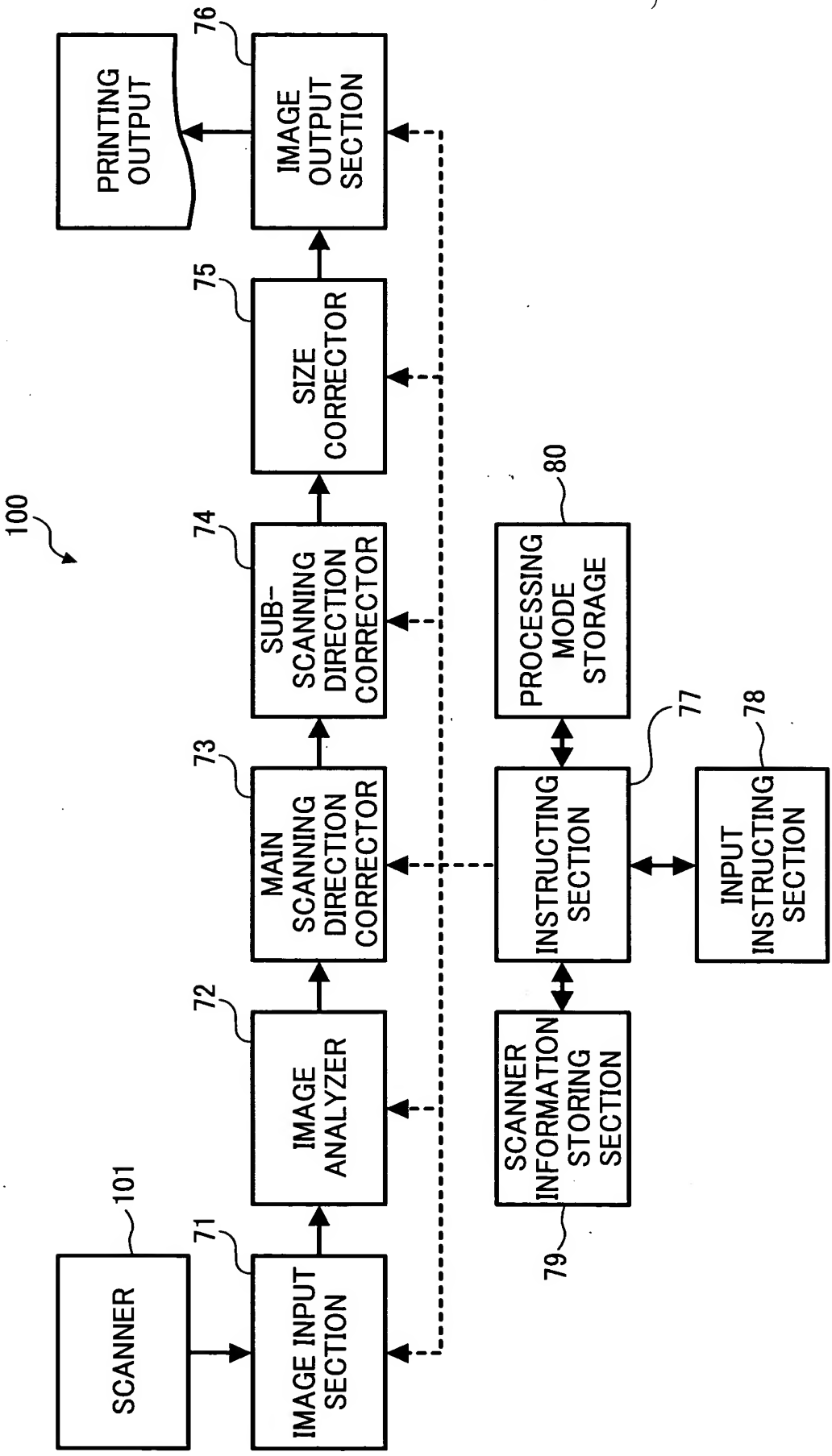

100
SCANNER
101
IMAGE INPUT SECTION
71
IMAGE ANALYZER
72
MAIN SCANNING DIRECTION CORRECTOR
73
SUB-SCANNING DIRECTION CORRECTOR
74
SIZE CORRECTOR
75
IMAGE OUTPUT SECTION
76
PRINTING OUTPUT
SCANNER INFORMATION STORING SECTION
79
INSTRUCTING SECTION
77
PROCESSING MODE STORAGE
80
INPUT INSTRUCTING SECTION
78

FIG. 10

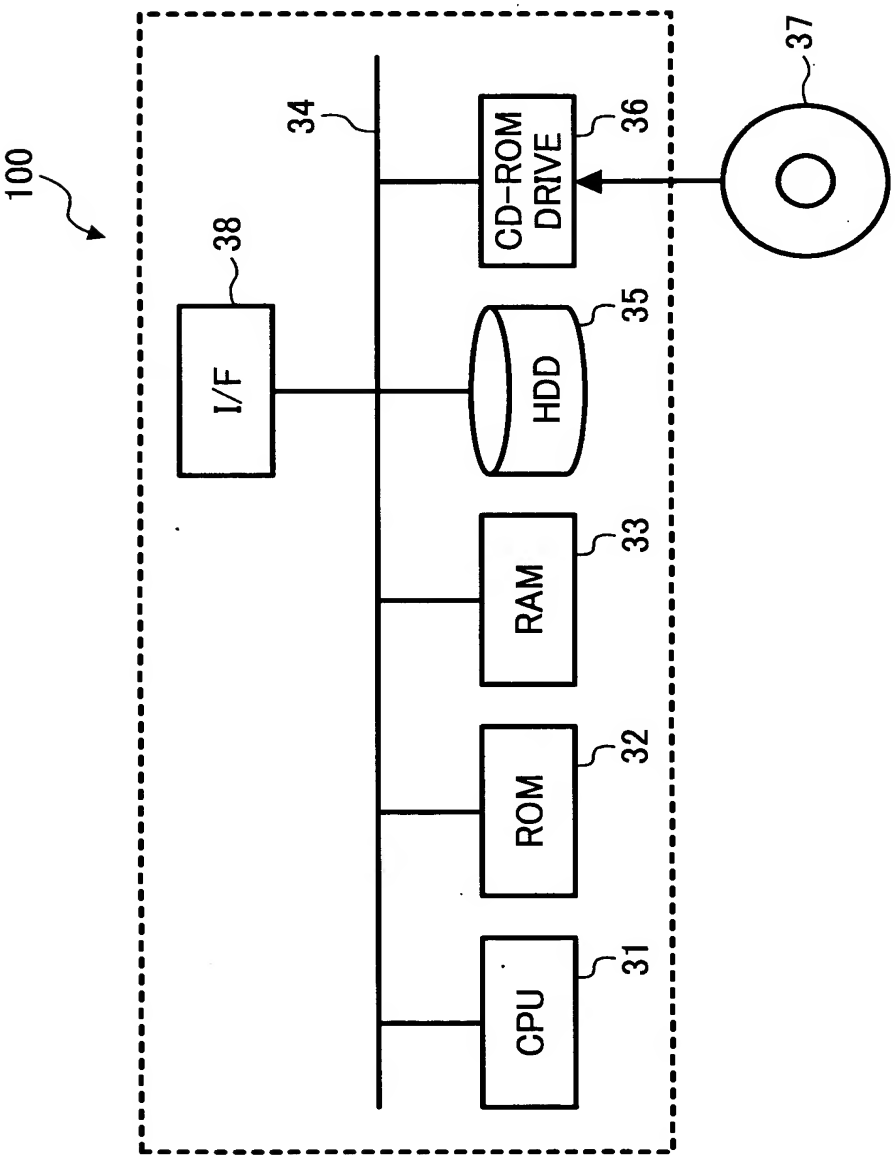


FIG. 11

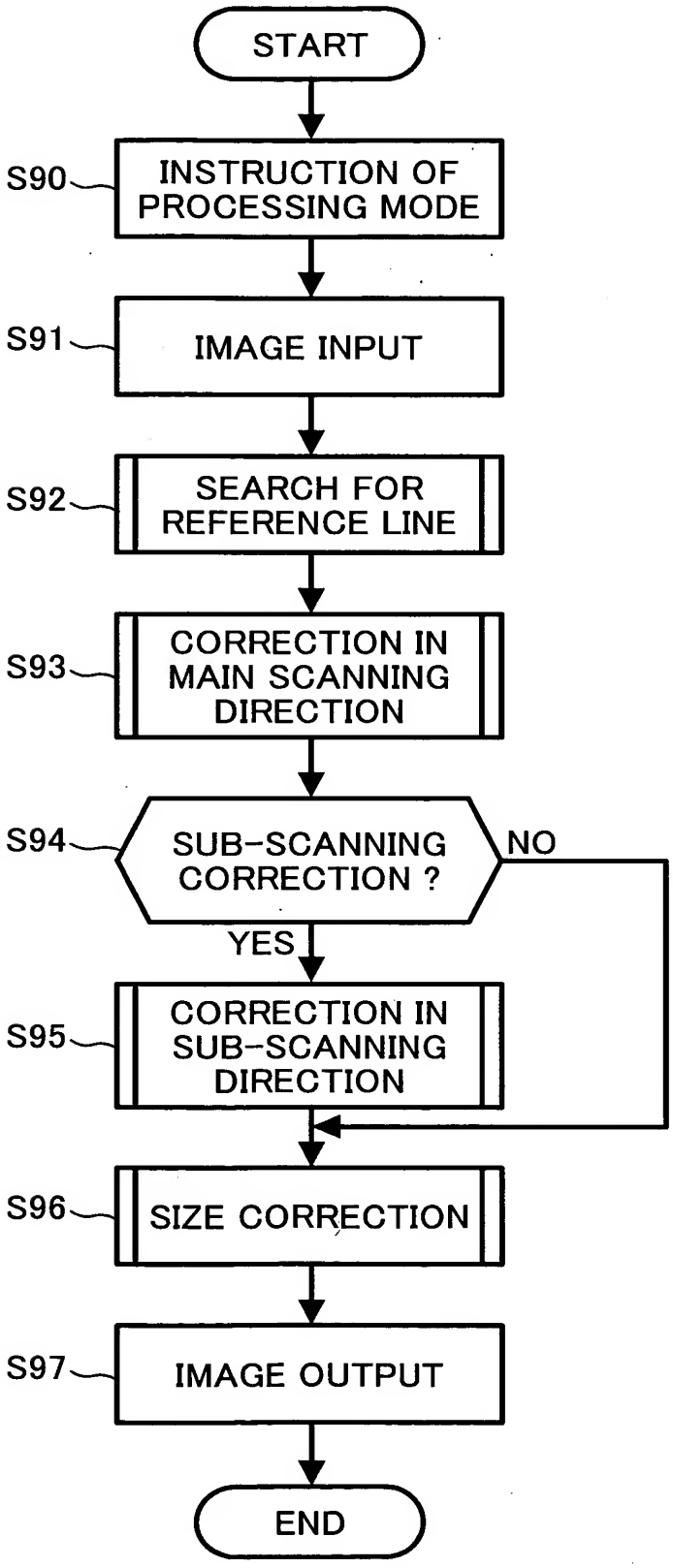

START
S90
INSTRUCTION OF PROCESSING MODE
S91
IMAGE INPUT
S92
SEARCH FOR REFERENCE LINE
S93
CORRECTION IN MAIN SCANNING DIRECTION
S94
SUB-SCANNING CORRECTION ?
NO
YES
S95
CORRECTION IN SUB-SCANNING DIRECTION
S96
SIZE CORRECTION
S97
IMAGE OUTPUT
END

FIG. 12

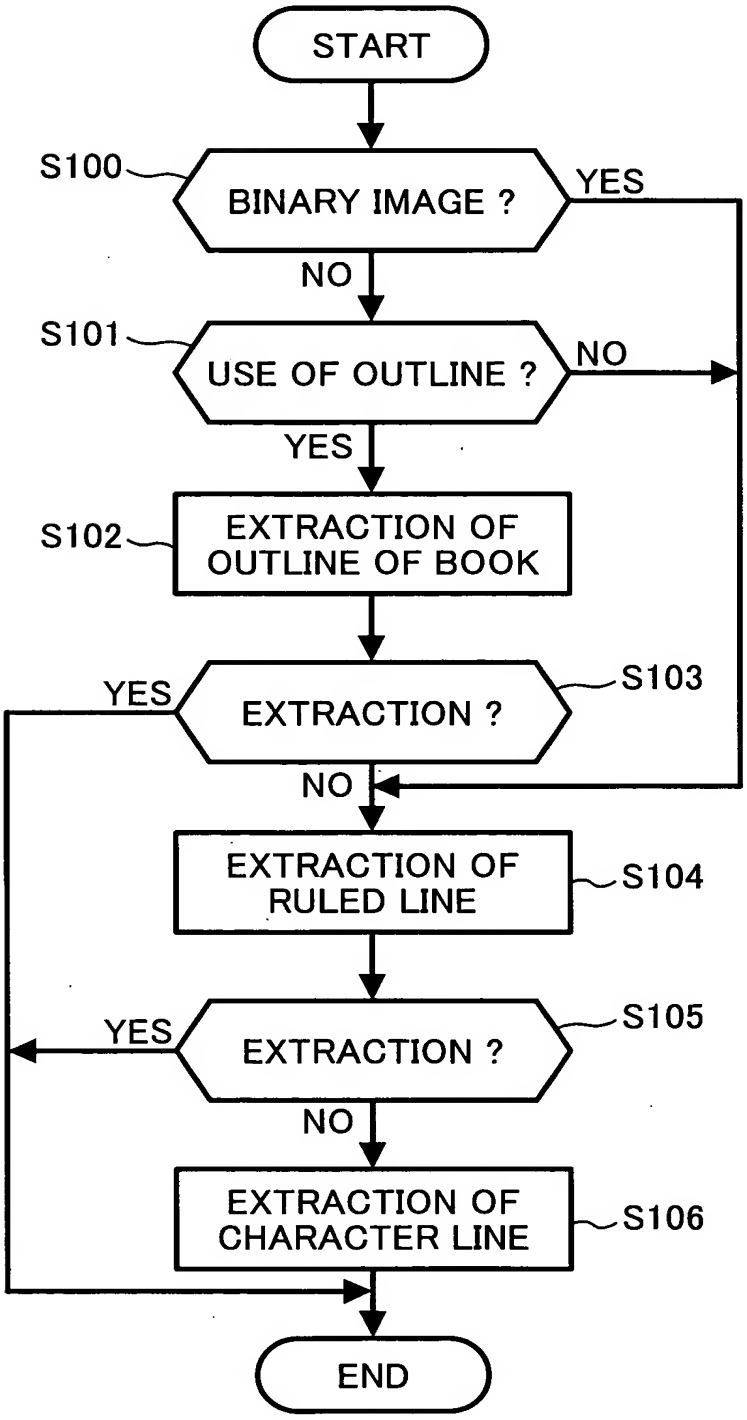

START
S100
BINARY IMAGE ?
YES
NO
S101
USE OF OUTLINE ?
NO
YES
S102
EXTRACTION OF OUTLINE OF BOOK
YES
EXTRACTION ?
S103
NO
EXTRACTION OF RULED LINE
S104
YES
EXTRACTION ?
S105
NO
EXTRACTION OF CHARACTER LINE
S106
END

FIG. 13

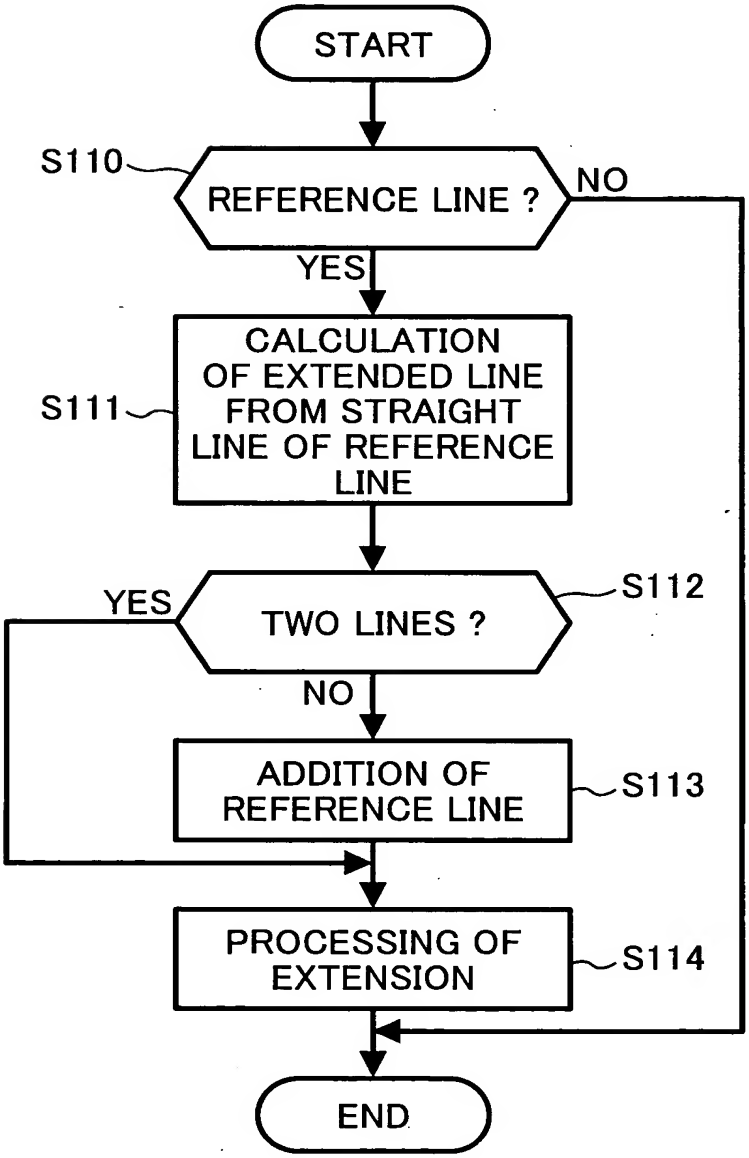

START
S110
REFERENCE LINE ?
NO
YES
CALCULATION OF EXTENDED LINE FROM STRAIGHT LINE OF REFERENCE LINE
S111
YES
TWO LINES ?
S112
NO
ADDITION OF REFERENCE LINE
S113
PROCESSING OF EXTENSION
S114
END

FIG. 14

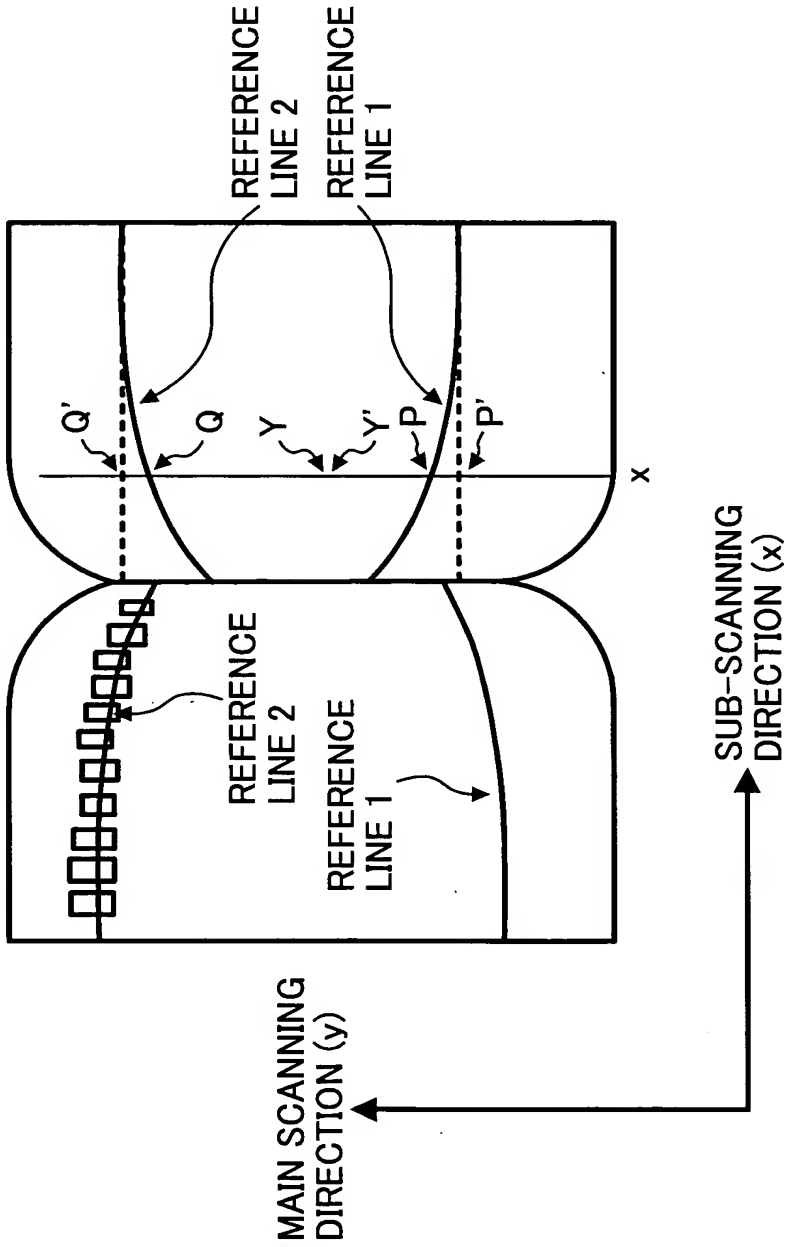

REFERENCE LINE 2
REFERENCE LINE 1
Q'
Q
Y
Y'
P
P'
x
REFERENCE LINE 2
REFERENCE LINE 1
SUB-SCANNING DIRECTION (x)
MAIN SCANNING DIRECTION (y)

FIG. 15

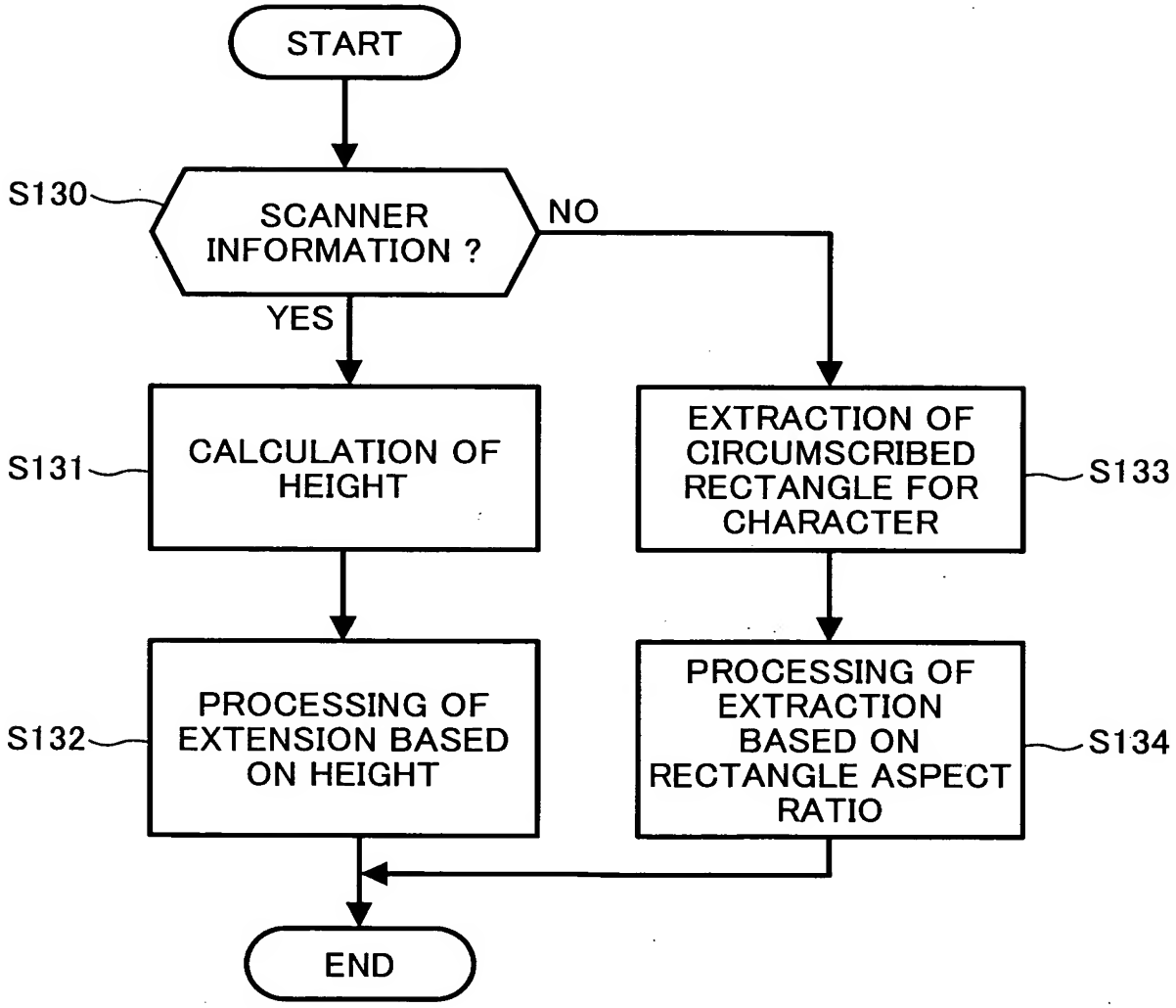

START
S130
SCANNER INFORMATION ?
NO
YES
S131
CALCULATION OF HEIGHT
S132
PROCESSING OF EXTENSION BASED ON HEIGHT
EXTRACTION OF CIRCUMSCRIBED RECTANGLE FOR CHARACTER
S133
PROCESSING OF EXTRACTION BASED ON RECTANGLE ASPECT RATIO
S134
END

FIG. 16

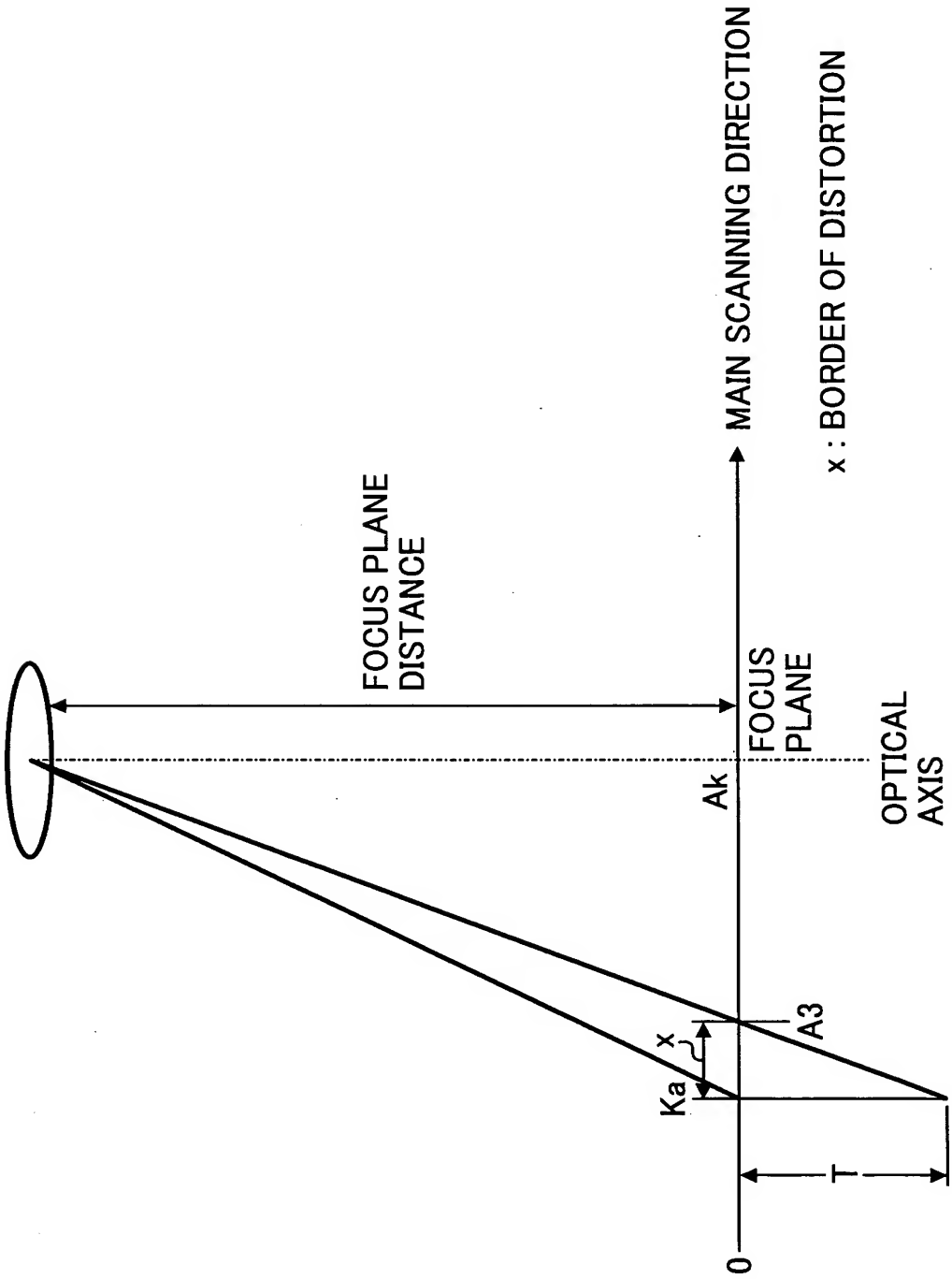
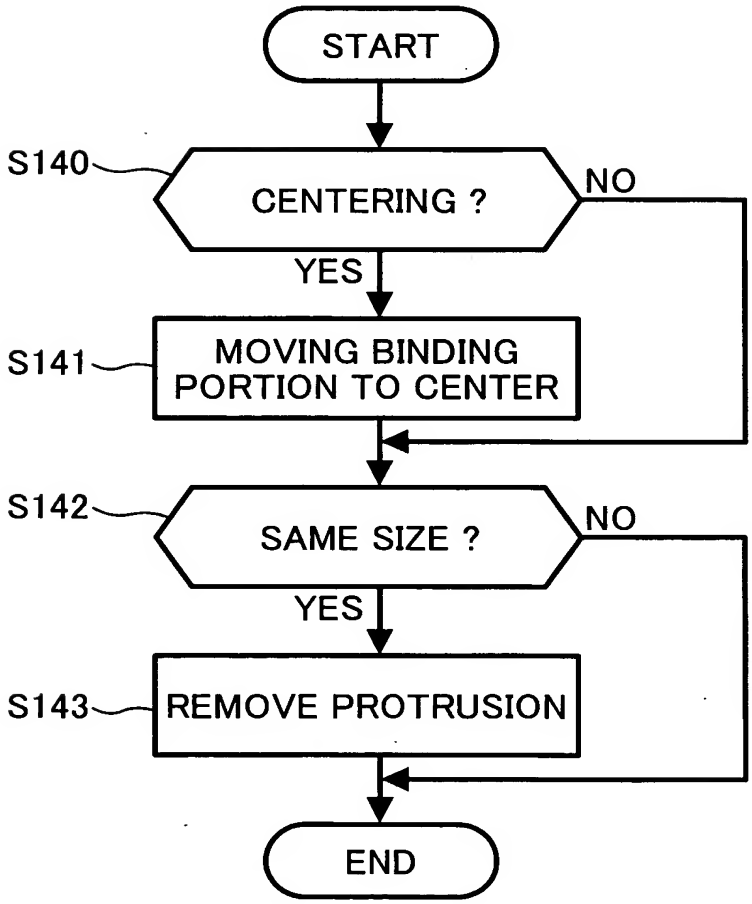

MAIN SCANNING DIRECTION
x : BORDER OF DISTORTION
FOCUS PLANE DISTANCE
FOCUS PLANE
OPTICAL AXIS
Ak
A3
x
Ka
T
0

FIG. 17


START
S140
CENTERING ?
NO
YES
S141
MOVING BINDING PORTION TO CENTER
S142
SAME SIZE ?
NO
YES
S143
REMOVE PROTRUSION
END